

Peters, Nisipak E

RE/ENGO = 10.85

Computer Engineering

14) From

$$\frac{dy}{dt} = Y_{in} - Y_{out}$$

$$\frac{dy}{dt} = 50(1 + \sin t) - 2.5\% \text{ of } y$$

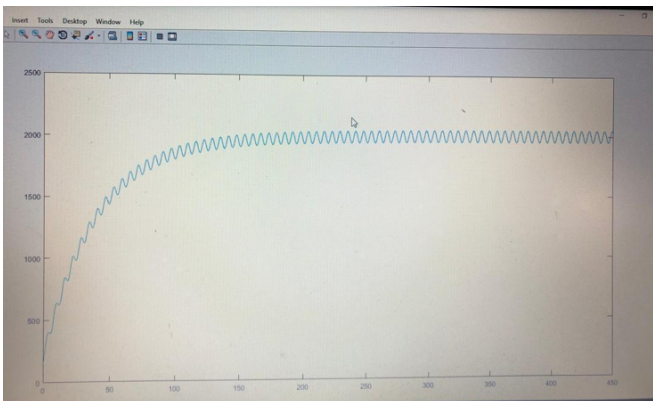
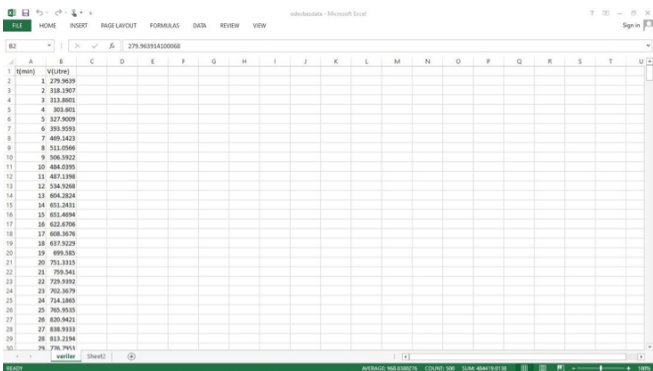
$$\frac{dy}{dt} = 50(1 + \sin t) - 0.025y$$

By separating the values

$$\frac{dy}{y} + 0.025y = 50(1 + \sin t)$$

multiply both sides by dt

$$1 + 0.025y dy = 50(1 + \sin t) dt$$



```
1 clear
2 clear
3 clc
4 close all
5 syms m t
6 ans = dsolve('Dm+0.025*m=50+50*sin(t)', 'm(0)=150')
7 t = 0:0.5:450
8 tn = subs(ans, t)
9 plot(t, tn)
```

Command Window

New to MATLAB? See resources for [Getting Started](#).

445.5000 446.0000 446.5000 447.0000 447.5000 448.0000 448.5000 449.0000 449.5000 450.0000

tn =

[ 150, 2000 - (2000\*1601^(1/2)\*cos(atan(1/40) + 1/2))/1601 - (2881850\*exp(-1/80))/1601, 2000 - (2000\*1601^(1/2)\*cos(atan(1/40) + 1/2))/1601 - (2881850\*exp(-1/80))/1601, ...]